REVIEW PLAN

MRLS R471-460 and L-455, KANSAS and MISSOURI – Section 216 FLOOD DAMAGE REDUCTION PROJECT FEASIBILITY STUDY PHASE

1. DOCUMENT OBJECTIVE. The purpose of this document is to outline the project review process in accordance with EC 1105-2-408 and provide guidance to the PDT team on the specific review levels, responsibilities, and process requirements for execution of review on the MRLS R471-460 and L-455 levee study.

2. GENERAL INFORMATION.

Executive Summary -- Study Purpose and Background.
The U.S. Army Corps of Engineers Kansas City District, along with local project sponsors, are conducting a feasibility study of the existing flood risk management project for the Saint Joseph, Missouri, and Elwood, Kansas, metropolitan areas. The study is authorized under Section 216 of the 1970 Flood Control Act (review of completed civil works).

The feasibility study will update and verify data on the reliability of the existing flood damage reduction units and develop alternative plans (including a review of the "no Federal action" alternative) for reliability (performance) improvement to reduce damages from potential flooding on the Missouri River in the vicinity of Saint Joseph. The recommended plan for increasing the reliability of the system will be selected through the basic tests of technical effectiveness & completeness, economic feasibility, and environmental acceptability.

Study Authority. Section 216 of the 1970 Flood Control Act provides authority to reexamine completed civil works. Section 216 reads as follows:

> *The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects, the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to the significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying structures or their operation, and for improving the quality of the environment in the overall public interest.*

Original Project Authority
The original MRLS R471-460 and L-455 levee units were authorized by the Flood Control Act of 1944 (Public Law 534, 78th Congress).

Feasibility Study Objectives
The Kansas City District is undertaking this feasibility study with the following objectives:
1. adequately evaluate the reliability/performance of the existing levee system,
2. formulate plans for increasing the levee system reliability through a cost-shared construction project, and if such plans are deemed feasible, then

3. develop the documentation necessary to seek project authorization and implementation.

Summary Study Scope and Execution Parameters.
This is a feasibility study of the Missouri River and associated flood risk management works within the immediate metropolitan area and vicinity of Saint Joseph, Missouri. The overall project contains two official levee units located along the Missouri River, Unit R471-460 on the right bank and Unit L-455 on the left bank. Engineering, economic, and environmental studies are underway to evaluate the possibilities of increasing the performance reliability of the units within the system.

Local Sponsorship and Funding.
The three owner-operators of the existing units are listed below. These non-Federal organizations own and maintain the systems with the Corps providing regular inspections and technical review of significant modifications to the system. Feasibility funding source is 50% Federal General Investigations (GI) -- Civil Works Appropriation & 50% local cost share funding. The three levee districts signed a Feasibility Cost Sharing Agreement (FCSA) with the Corps on DATE.

Unit R71-460	Elwood-Gladden Drainage District (Kansas Sections) Saint Joseph Airport Levee District (Missouri Section)
Unit L-455	South Saint Joseph Levee District

Description of Existing Overall Project and Problem.
Units R471-460 and L-455 were constructed as part of the comprehensive Missouri River Levee System (MRLS) authorized by the Flood Control Act of 1944.

The area protected by levee unit R471-460 on the right bank of the river is 13,524 acres. It includes the towns of Elwood, Kansas, (2000 pop. 1,145), Wathena, Kansas, (2000 pop. 1,348) and unincorporated rural areas. This area includes 3,374 acres situated in the State of Missouri, which was cut off as a result of the 1952 flood and subsequent realignment of the Missouri River. The cut-off area is the former French Bottoms and contains Rosecrans Memorial Airport and Missouri Air National Guard Base.

The area protected by levee unit L-455, located on the left bank of the river immediately downstream and south of levee unit R471-460, is 7,500 acres. It includes the southern portion of St. Joseph, Missouri, (2000 pop. 73,990) and unincorporated areas. Important features of the protected area include the stockyards and old central industrial district; home to several large companies and public facilities including the St. Joseph water treatment plant.

Unit R460-471 failed from overtopping on July, 26, 1993, causing over $65 million in damages. Virtually the whole town of Elwood, Kansas was devastated. An estimated 450 homes, and more than 100 businesses, in the town of 1,079 people were inundated. The average depth of floodwaters in Elwood was six feet. Rosecrans Memorial Airport, serving the St. Joseph area and housing a Missouri Air National Guard Base, suffered an estimated $16 million dollars in flood damages.

During the 1993 event, Unit L-455 protected 7,500 acres of industrial, residential, and farmland, preventing approximately $176 million in damages. However, floodwaters were close to overtopping the levee, which would have caused catastrophic damages to an industrial area estimated to contain assets of over $1 billion and an annual payroll in excess of $50 million. Businesses closed down because of concern for the safety of the levee, resulting in lost wages, productivity, and sales.

In 1994, FEMA initiated a flood insurance study of Buchanan County encompassing protected areas behind both R460-471 and L-455. In 1996, the Natural Resources Conservation Service (NRCS), working as a technical agent for FEMA in conducting the flood insurance study, asked the Corps of Engineers to verify certification of the R460-471 levee unit. After a process of hydraulic evaluations made in conjunction with the reconnaissance study, the Kansas City District determined that the R460-471 levee unit could not pass the 1 percent chance flood with 90 percent reliability nor did it have adequate freeboard. In December 1999, the R460-471 unit was formally decertified.

3. LEVELS OF REVIEW

Internal Peer Review (IPR) – Internal Peer Review will be conducted on the project feasibility study. As part of the Quality Management Plan on any project, there are internal reviews or design checks that constitute quality control for each deliverable product. It is the responsibility of each product development team member, their supervisors, and the project manager to ensure that every product receives an internal quality control review. It is the responsibility of the supervisor or section chief for each team member to ensure that a qualified internal peer review is selected and conducts a review of their product prior to delivery to the project manager, or prior to completion.

Independent Technical Review (ITR) – Independent Technical Review will be conducted on the feasibility study. Independent Technical Review is an independent review, outside of Kansas City District, of the deliverables for the project and constitutes an independent review of the entire project. In accordance with EC 1105-2-408 dated 31 May 2005, and CECW-CP Memorandum dated 8 November 2006, all outside independent review teams for qualifying projects is coordinated through the Corps of Engineers' Flood Damage Reduction Center of Expertise (CX, South Pacific Division) by the District. The CX works collaboratively with the Division staff and the District project manager to find team member staff outside the Kansas City District with the requisite experience and qualifications to review the project. Review comments will be documented, processed, and resolved through the Dr. Checks software package.

External Peer Review (EPR) – External Peer Review **(**EPR) does not apply to the St. Joseph Levee project and will not be conducted. EPR is an additional national level independent review process, outside the Corps of Engineers, to ensure that the projects are of national or regional interest and meet the requirements of Federal participation. Specific criteria that trigger the development and implementation of EPR are projects where novel methods are utilized, where the project presents complex challenges, where the use of precedent setting methods or models,

where the project will be likely to present landmark conclusions that will affect policy, or where the project is centered or focused on an issue or proposal that is highly controversial.

The St. Joseph Levee project is an evaluation of the condition and performance of an existing levee system. There are currently no features or components of this project that are anticipated to be highly controversial or significant to national policy. The anticipated overall cost of the project is considered to be well below any threshold that might trigger EPR under any future provisions of the Water Resources Development Act (WRDA). In the proposed evaluation of the St. Joseph levees, Corps of Engineers criteria, methods, and models to be utilized are recognized standard criteria and methods with no novel or precedent setting methods anticipated. Based on the proposed levee evaluation project plan and the criteria established for development of EPR, no External Peer Review process will be developed for this project.

Architect-Engineer (A-E) or Consulting Contacts - Contracts used on this project will undergo a Quality Assurance Review of each deliverable product by assigned District PDT members. Additionally, any products developed by contract will also undergo ITR along with other products as outlined in the ITR paragraph above. All contractors are required to develop a Quality Management Plan to be submitted as the first deliverable for the contract. This will detail the firm's internal quality management and design check review processes, and is subject to prior approval by the Project Manager and PDT in accordance with the established Kansas City District Business Quality Procedures.

4. SELECTED REVIEW PROCESS(S)

The selected review process level for the St. Joseph Levee project is the Independent Technical Review. The ITR will be developed in coordination with the CX for Flood Damage Reduction, and the CX representative Mr. Roger Setters. This process will be coordinated through the Northwestern Division Planning Office. Internal peer review (IPR) or internal design checks will be conducted in accordance with the approved District Business Practices, as outlined above. It is anticipated that A-E contracts may be utilized for development of technical products for this project. As needed, contracts will be procured in accordance with the prior approval of the District Acquisition Strategy Board, as outlined in the approved District Business Quality Procedures.

ITR References:

- Refer to ER 1110-1-105, the primary Corps ITR regulation (see enclosed exhibit for summary of the major ITR requirements described in this regulation).

- EC 1105-2-408 dated 31 May 2005

- CECW-CP Memoranda dated 8 November 2006 and 30 March 2007.

- Refer to Kansas City District Business Quality Procedure (BQP) 5.5.04 (Quality Plans). Pertinent excerpts are quoted below.

5.6 ITRT Members:

- *Verify compliance with established policy, principles and procedures*
- *Verify criteria applied*
- *Verify assumptions, methods, procedures, and material used in analyses*
- *Evaluate alternatives*
- *Verify the appropriateness of data used and level of data obtained*
- *Verify completeness of design and documents*
- *Verify reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy.*
- *Conduct spot checks for interdisciplinary coordination*
- *Identify the specialized knowledge, experience, or training required to competently complete the product*
- *Verify comments are resolved by:*
    - *Verifying incorporation of their comments or,*
    - *Accepting the verification conducted by either the PM or ITRT Leader or,*
    - *Withdrawing the comment*

6.1.7.7.3 Independent Technical Review: Qualified staff verifies the work meets reasonable professional levels and satisfies the client's need and expectation. For small, simple, low complexity, low risk projects, independent technical review can be accomplished at the section level. Independent technical review can be managed at branch levels when a few disciplines are involved, the project is of moderate cost and complexity and the risk for life safety is relatively low. Independent technical review for all other projects should include individuals who do not have a vested interest in the project and are not involved in the day-to-day direction of the product. The PMP should define the level of independent technical review. Independent technical review is not a detailed check but a broad overview including:

- *Review of criteria applied*
- *Review of the methods of analysis and design*
- *Compliance with client and/or program requirements*
- *Completeness of design and documents*
- *Spot checks for interdisciplinary coordination*
- *Biddability, constructability, operability and environmental*

6.1.7.7.4 Independent reviewers are brought on board early on to participate in establishing criteria selection and broad approaches to be taken in addressing potential issues thus ensuring seamless review.

- Reviewers will be required to use the Dr Checks web-based system for comments. Refer to https://www.projnet.org/projnet/home/version1/index.cfm for additional Dr. Checks access information.

5. PRIMARY DISCIPLINES AND EXPERTISE NEEDED FOR THE ITR

Discipline-Specific Guidance & Requirements. ITR Team representation is required in the disciplines listed below. A statement of qualifications will be required for each team member prior to acceptance as an ITR Team member and for any subsequent changes thereto. Multiple requirements may be filled by one ITR team member, depending on individual qualifications.

Hydrology & Hydraulics: Team member will be an expert in the field of large-river hydrology & hydraulics, have a through understanding of the dynamics of the confluence of rivers & tributaries, and be familiar with interior drainage issues related to levee construction. The team member will have an understanding of computer modeling techniques that may be used for this project (HEC-HMS, HEC-RAS, and UNET).

Structural: Team member will have a thorough understanding of levee, flood wall, and retaining wall design, and structures typically associated with levees (pump stations, gatewell structures, utility penetrations, stoplog & sandbag gaps, and other closure structures).

Geotechnical: Team member will have extensive experience in levee & floodwall design, post-construction evaluation, and rehabilitation, including risk & reliability analysis.

Economics: Team member will have extensive experience in related projects, and have a thorough understanding of HEC-FDA.

Environmental/NEPA: Team member will be an expert in issues of environmental and NEPA compliance for similar projects.

Formulation: Team member will have a thorough understanding of current planning and policy guidance, and have experience in plan formulation for large-scale flood damage reduction projects.

Civil / Site / Utilities / Relocations: Team member will have experience in utility relocations and positive closure requirements for levee construction.

Cost Estimating: Team member will be familiar with cost estimating for similar projects using MCACES. Team member will be a Certified Cost Technician, Certified Cost Consultant, or Certified Cost Engineer.

Other disciplines involved in the project include Hazardous / Toxic Waste, Real Estate, Cultural Resources, and Legal. In each case, any required Independent Technical Review within these disciplines may be accomplished within Kansas City District or by other independent sources. The principles contained in this document also apply to these disciplines/functional areas. *(Exception: Legal review is not to be under the purview of the ITR Team Leader but is instead responsible to the Corps of Engineers Office of Counsel chain-of-command).*

ITR Team Leader. One member of the ITR Team will act as the team leader. Team leader designation will be finalized based on input from ITR Team members and the CENWK Project Manager, the PDT, and CENWK staff. The leader shall, in addition to discipline-specific requirements, be responsible for:

- Acting as a liaison between the Product Development Team and the ITR Team
- In conjunction with the PM, the ITR team leader will perform active coordination of the ITR process and study findings with the Corps Flood Damage Center Expertise (FDX) in San Francisco District, and ensure compliance with an adequate level of FDX review.
- Distributing information for review and coordinating efforts of the ITR Team
- Ensuring that individual ITR Team members are operating in accordance with the guidelines established for ITR by ER 1110-1-105 (see enclosed exhibit for summary of the major ITR requirements described in this regulation).
- The ITR team is *not* geographically co-located. Therefore, it is of paramount importance that the ITR Team Leader be capable of organizing the total ITR efforts across District and Division boundaries.
- A substitute ITR Team Leader from the ITR team will be named by the ITR team leader for periods of extended (over 60 days) absence.

Independent Technical Review Team Members and Organization.
Organization of the St. Joseph ITR Team is displayed at the attached ITR Organization Chart exhibit.

The ITR team members will be contacted on a regular basis by the corresponding PDT members so as to be kept aware of criteria selection and the broad approaches employed in this study thus ensuring a seamless review when products are submitted for ITR.

6. ITR SCHEDULE.

The feasibility phase was initiated in 1999 and later delayed to allow resolution of key hydrologic issues. Existing conditions ITR was accomplished in 2004. ITR of the Draft and Final Feasibility Reports was completed in 2006.

7. ITR BUDGET. Approximately $37,500 has been expended on the review of the draft and final report.

8. PUBLIC COMMENT OPPORTUNITIES

Review of the project review plan will be available on the Kansas City District website, link as follows: http://www.nwk.usace.army.mil/projects/r471-l455/, and at the request of interested parties.

Public and Agency Review for this project will be conducted in accordance with NEPA, as well as the provisions of the Water Resources Development Act (WRDA) 2000, and as outlined in ER 1105-2-100. As such the review plan will be available through all public and agency scoping and other processes for the project

9. AVAILABILITY OF PUBLIC COMMENTS TO REVIEW TEAM

Public input from the NEPA workshops and the public scoping meetings will be available to the ITR members to ensure that public comments have been considered in the development of reviews and final reports.